Cancer among children

1993-2022

(Excluding non-melanoma skin cancer)

(ICD10 codes: C00-C43, C45-C97; Aged 0-14)

Northern Ireland Cancer Registry

Northern Ireland Cancer Registry, 2025

An official statistics publication

ABOUT THIS REPORT

Contents

This report includes information on incidence of cancer among children (excluding non-melanoma skin cancer) as recorded by the Northern Ireland Cancer Registry (NICR). Incidence data is available annually from 1993 to 2022, however in order to provide stable and robust figures the majority of information presented in this report is based upon the average number of cases diagnosed in the last ten years.

Methodology

The methodology used in producing the statistics presented in this report, including details of data sources, classifications and coding are available in the accompanying methodology report available at: www.qub.ac.uk/research-centres/nicr/CancerInformation/official-statistics.

Official statistics

The incidence, prevalence and survival statistics in this publication are designated as official statistics signifying that they comply with the Code of Practice for Official Statistics. Further information on this code is available at code.statisticsauthority.gov.uk.

Cancer mortality data

The NI Statistics and Research Agency (NISRA) is the official statistics provider of cancer mortality data in Northern Ireland. However, for completeness, data on cancer mortality is also provided in this report. While analysis is conducted by NICR staff, the original data is provided courtesy of the General Register Office (NI) via the Department of Health.

Reuse of information

The information in this report (and any supplementary material) is available for reuse free of charge and without the need to contact NICR. However, we request that NICR is acknowledged as the source of any reused information. The following reference is recommended:
Northern Ireland Cancer Registry 2025. Cancer among children: 1993-2022. Available at: www.qub.ac.uk/research-centres/nicr

Further information

Further information is available at: www.qub.ac.uk/research-centres/nicr

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Acknowledgements

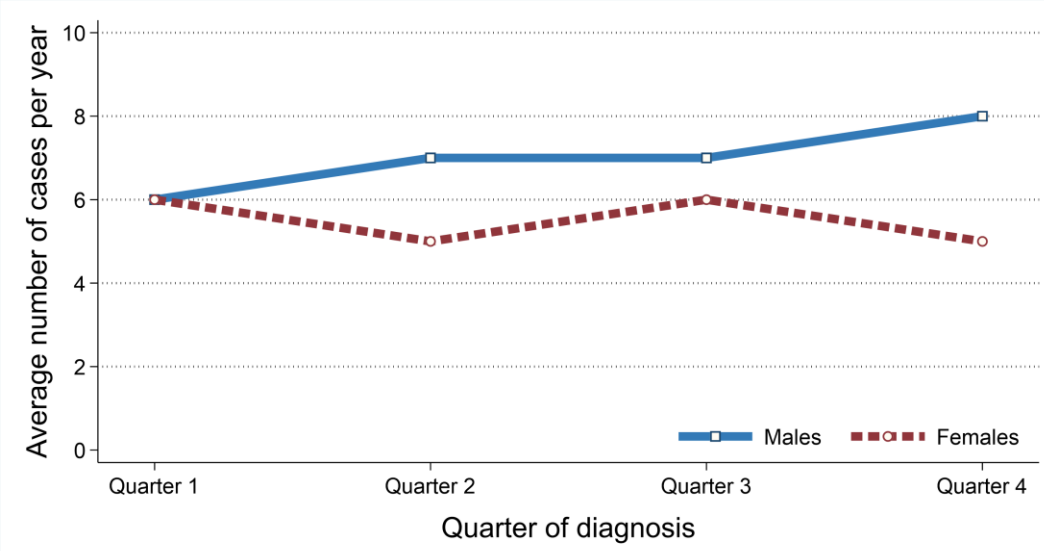
The Northern Ireland Cancer Registry (NICR) uses data provided by patients and collected by the health service as part of their care and support.

NICR is funded by the Public Health Agency and is based in Queen's University, Belfast.

INCIDENCE

- There were 498 cases of cancer among children (excluding non-melanoma skin cancer) diagnosed during 2013-2022 in Northern Ireland. On average this was 50 cases per year.
- During this period 43.6% of childhood cancer cases were among girls (Male cases: 281, Female cases: 217). On average there were 28 male and 22 female cases of cancer among children per year.
- The most common diagnosis quarter during 2013-2022 was quarter 4 among males with 8 cases per year and quarter 3 and quarter 1 among females with 6 cases per year.

Figure 1: Average number of cases of cancer among children per year in 2013-2022 by quarter of diagnosis



Quarter of diagnosis	Average number of cases per year	
	Males	Females
Quarter 1	6	6
Quarter 2	7	5
Quarter 3	7	6
Quarter 4	8	5

- The childhood cancer incidence rates for each gender were 15.1 cases per 100,000 males aged 0 to 14 and 12.2 cases per 100,000 females aged 0 to 14.

INCIDENCE BY CANCER TYPE

- During 2013-2022 the most common childhood cancer types among males were:
  - Leukaemia, myeloproliferative disease, and myelodysplastic disease (39.1%),
  - Central nervous system and miscellaneous intracranial and intraspinal neoplasm (22.1%) and
  - Lymphoma and reticuloendothelial neoplasm (13.5%).

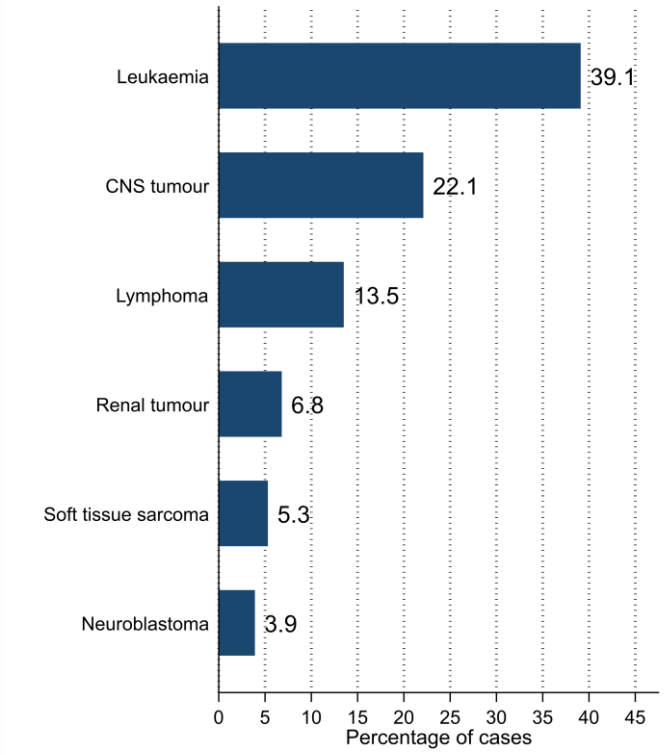
- Among females they were:
  - Leukaemia, myeloproliferative disease, and myelodysplastic disease (33.2%),
  - Central nervous system and miscellaneous intracranial and intraspinal neoplasm (18.9%) and
  - Renal tumour (9.2%).

Table 1: Number of cases of cancer among children diagnosed in 2013-2022 by cancer type

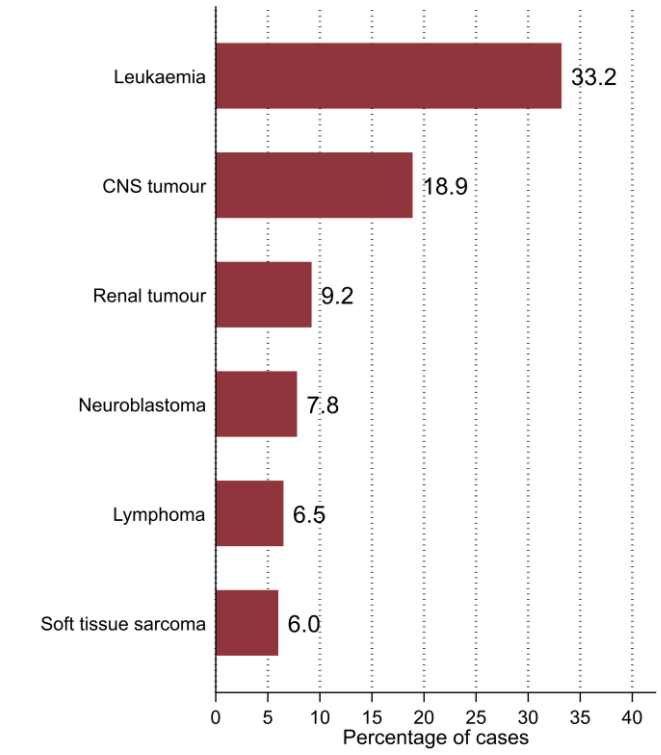
Cancer type	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Cancer among children	**498**	**50**	**281**	**28**	**217**	**22**
	.	.	.	.	.	.
Central nervous system and miscellaneous intracranial and intraspinal neoplasm	103	10	62	6	41	4
Leukaemia, myeloproliferative disease, and myelodysplastic disease	182	18	110	11	72	7
Lymphoma and reticuloendothelial neoplasm	52	5	38	4	14	1
Neuroblastoma and other peripheral nervous cell tumour	28	3	11	1	17	2
Renal tumour	39	4	19	2	20	2
Soft tissue and other extraosseous sarcoma	28	3	15	2	13	1
Other cancer among children	66	7	26	3	40	4

Figure 2: Proportion of cases of cancer among children in 2013-2022 by cancer type

MALE



FEMALE

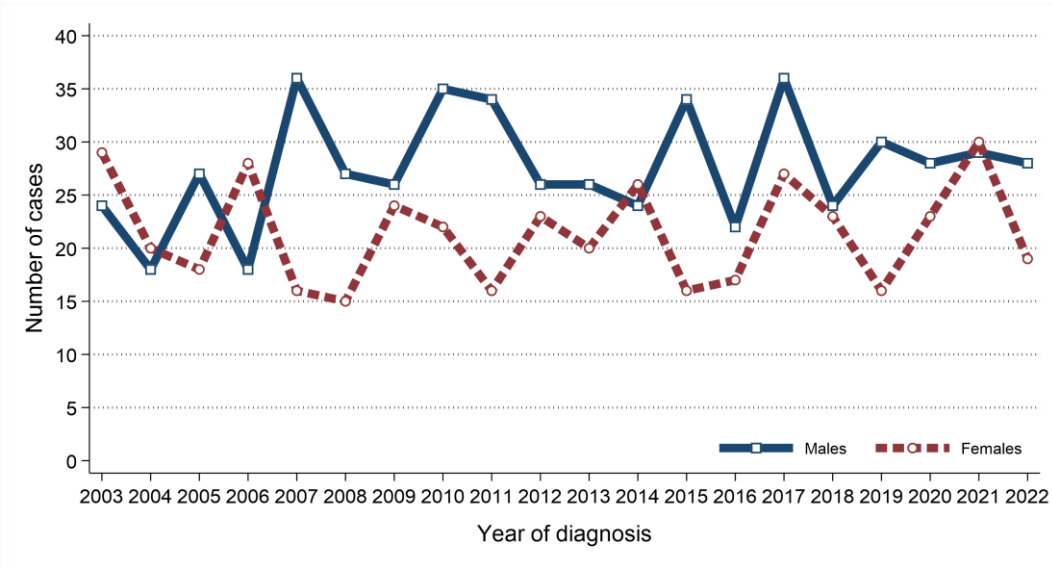


Note: CNS tumour = Central nervous system and miscellaneous intracranial and intraspinal neoplasm, Leukaemia = Leukaemia, myeloproliferative disease, and myelodysplastic disease, Lymphoma = Lymphoma and reticuloendothelial neoplasm, Soft tissue sarcoma = Soft tissue and other extraosseous sarcoma, Neuroblastoma = Neuroblastoma and other peripheral nervous cell tumour.

INCIDENCE TRENDS

- The number of cases of childhood cancer among males decreased between 2013-2017 and 2018-2022 by 2.1% from 142 cases (28 cases per year) to 139 cases (28 cases per year).
- The number of cases of childhood cancer among females increased between 2013-2017 and 2018-2022 by 4.7% from 106 cases (21 cases per year) to 111 cases (22 cases per year).

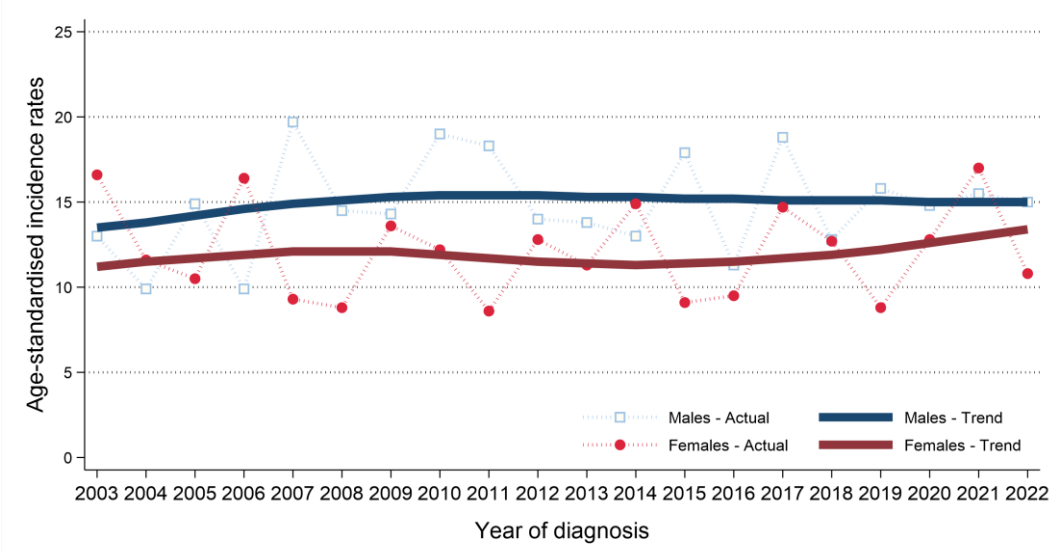
Figure 3: Trends in number of cases of cancer among children diagnosed from 2003 to 2022



Year of diagnosis	Number of cases	
	Males	Females
2013	26	20
2014	24	26
2015	34	16
2016	22	17
2017	36	27
2018	24	23
2019	30	16
2020	28	23
2021	29	30
2022	28	19

- Male age-standardised childhood cancer incidence rates decreased between 2013-2017 and 2018-2022 by 1.3% from 15.0 to 14.8 cases per 100,000 males. This change was not statistically significant.
- Female age-standardised childhood cancer incidence rates increased between 2013-2017 and 2018-2022 by 5.1% from 11.8 to 12.4 cases per 100,000 females. This change was not statistically significant.

Figure 4: Trends in incidence rates of cancer among children from 2003 to 2022



Age-standardised incidence rates illustrate the change in the number of cases within a population of a fixed size and age structure (2013 European Standard).

They thus represent changes other than those caused by population growth and/or ageing.

Trends can also be influenced by changes in how cancer is classified and coded. (e.g. the move from ICD-0-2 to ICD-0-3 in 2019).

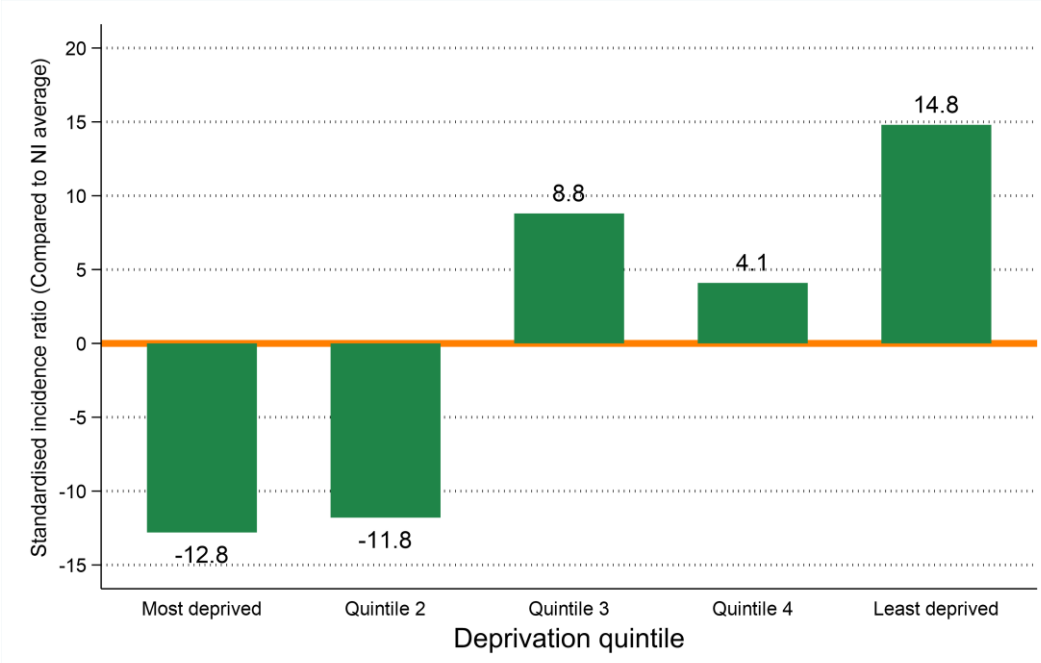
INCIDENCE BY DEPRIVATION

- The number of cases of cancer among children diagnosed during 2013-2022 varied in each deprivation quintile due to variations in population size and age.
- After accounting for these factors, incidence rates:
  - in the most socio-economically deprived areas did not vary significantly from the NI average.
  - in the least socio-economically deprived areas did not vary significantly from the NI average.

Table 2: Number of cases of cancer among children diagnosed in 2013-2022 by deprivation quintile

Deprivation quintile	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**498**	**50**	**281**	**28**	**217**	**22**
	.	.	.	.	.	.
Most deprived	90	9	55	6	35	4
Quintile 2	93	9	48	5	45	5
Quintile 3	114	11	61	6	53	5
Quintile 4	105	11	65	7	40	4
Least deprived	96	10	52	5	44	4

Figure 5: Standardised incidence ratio comparing deprivation quintile to Northern Ireland for cancer among children diagnosed in 2013-2022



Standardised incidence ratios compare incidence rates in each deprivation quintile with the Northern Ireland incidence rate.

A value above 0 means that incidence rates in that deprivation quintile are greater than the NI average.

This measure takes account of population size and age structure. Differences are thus not a result of these factors.

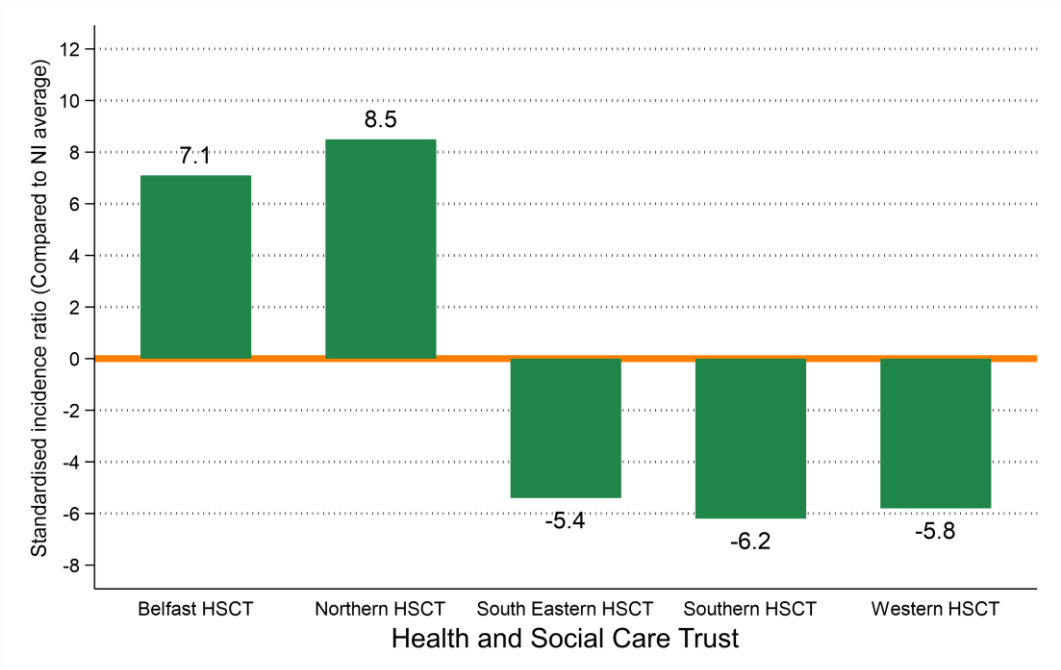
INCIDENCE BY HEALTH AND SOCIAL CARE TRUST

- The number of cases of cancer among children diagnosed during 2013-2022 varied in each Health and Social Care Trust due to variations in population size and age.
- After accounting for these factors, incidence rates:
  - in Belfast HSCT did not vary significantly from the NI average.
  - in Northern HSCT did not vary significantly from the NI average.
  - in South Eastern HSCT did not vary significantly from the NI average.
  - in Southern HSCT did not vary significantly from the NI average.
  - in Western HSCT did not vary significantly from the NI average.

Table 3: Number of cases of cancer among children diagnosed in 2013-2022 by Health and Social Care Trust

Health and Social Care Trust	All persons		Male		Female	
	Total cases in period	Average cases per year	Total cases in period	Average cases per year	Total cases in period	Average cases per year
Northern Ireland	**498**	**50**	**281**	**28**	**217**	**22**
	.	.	.	.	.	.
Belfast HSCT	95	10	54	5	41	4
Northern HSCT	133	13	86	9	47	5
South Eastern HSCT	87	9	45	5	42	4
Southern HSCT	105	11	63	6	42	4
Western HSCT	78	8	33	3	45	5
Unknown	0	0	0	0	0	0

Figure 6: Standardised incidence ratio comparing Health and Social Care Trust to Northern Ireland for cancer among children diagnosed in 2013-2022



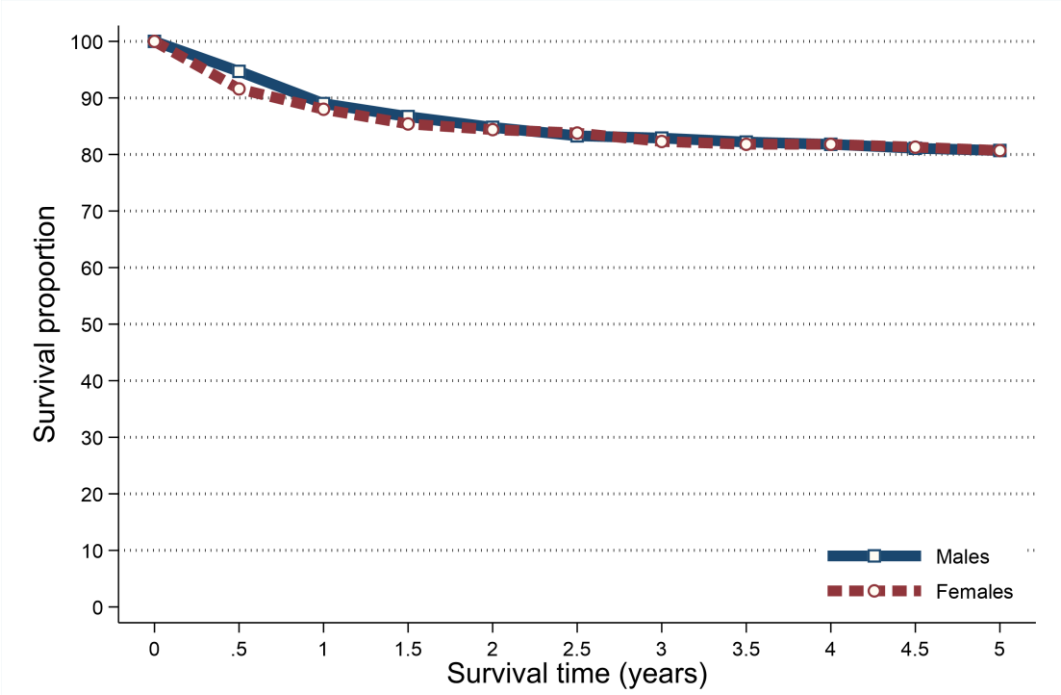
SURVIVAL

- 88.5% of patients were alive one year and 80.6% were alive five years from a childhood cancer diagnosis in 2008-2017. (observed survival)
- Net survival (NS), which removes the effect of deaths from causes unrelated to cancer, was 88.6% one year and 80.7% five years from a childhood cancer diagnosis in 2008-2017.
- Five-year survival (NS) for cancer among children patients diagnosed in 2008-2017 was 80.7% among men and 80.7% among women.

Table 4: Survival from cancer among children for patients diagnosed in 2008-2017

Time since diagnosis	All persons		Male		Female	
	Observed survival	Net survival	Observed survival	Net survival	Observed survival	Net survival
6 months	93.4%	93.4%	94.7%	94.7%	91.6%	91.6%
One year	88.5%	88.6%	88.9%	89.0%	88.0%	88.0%
Two years	84.5%	84.6%	84.7%	84.8%	84.3%	84.4%
Five years	80.6%	80.7%	80.5%	80.7%	80.6%	80.7%

Figure 7: Net survival from cancer among children for patients diagnosed in 2008-2017



Observed survival examines the time between diagnosis and death from any cause, however, due to the inclusion of non-cancer deaths it may not fully reflect how changes in cancer care impact survival from cancer.

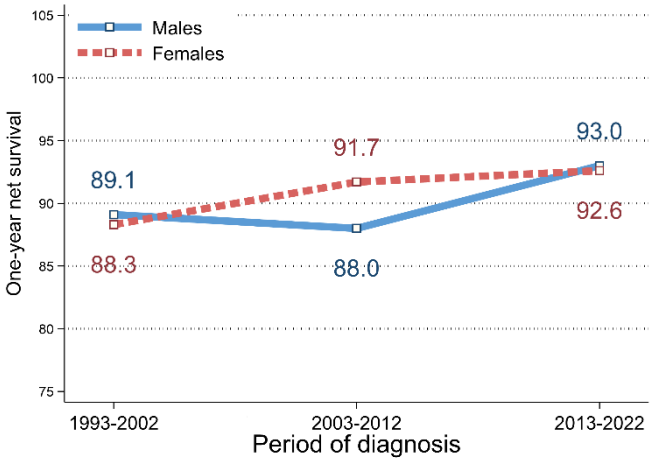
Net survival provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It is more widely used to assess the impact of changes in cancer care on patient survival.

SURVIVAL TRENDS

ONE-YEAR NET SURVIVAL

- Between 2003-2012 and 2013-2022 there was no significant change in one-year survival (NS) from cancer among children aged 0-14.
- Between 1993-2002 and 2013-2022 there was no significant change in one-year survival (NS) from cancer among children aged 0-14.

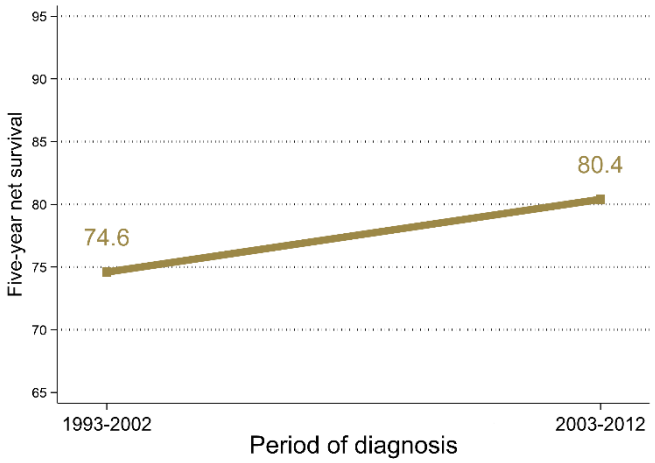
Figure 8: Trends in one-year net survival from cancer among children in 1993-2022

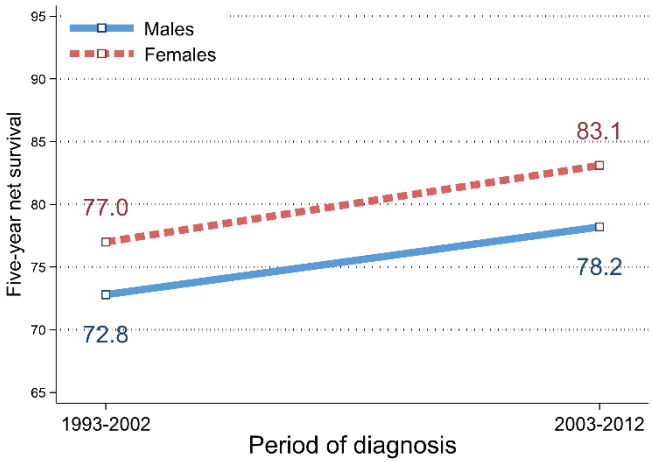


FIVE-YEAR NET SURVIVAL

- Between 1993-2002 and 2003-2012 there was no significant change in five-year survival (ASNS) from cancer among children aged 0-14.

Figure 9: Trends in five-year net survival from cancer among children in 1993-2012

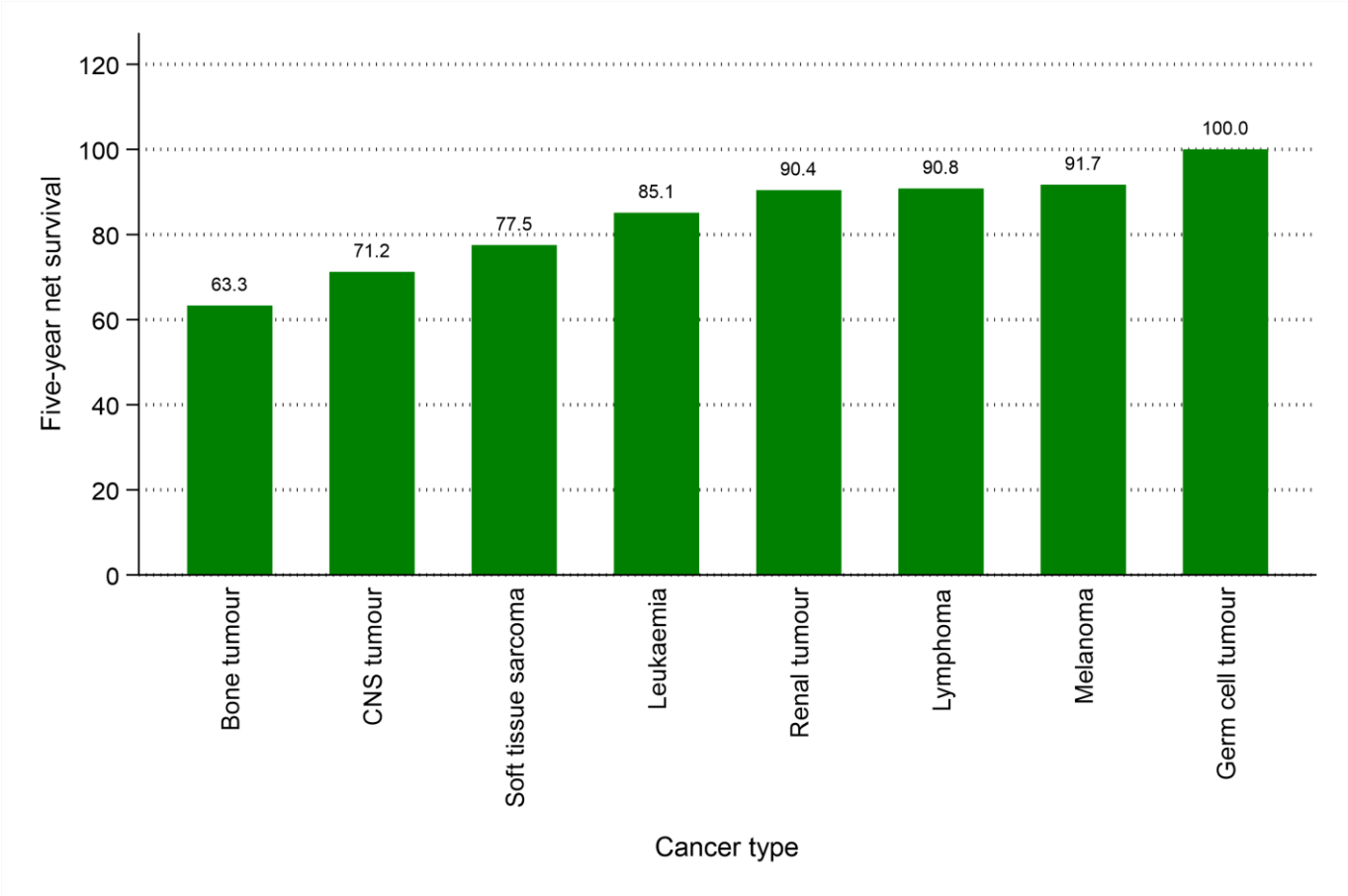




SURVIVAL BY CANCER TYPE

- Five-year survival (NS) for children aged 0-14 diagnosed with cancer in 2008-2017 ranged from 100.0% for germ cell tumour, trophoblastic tumour, and neoplasm of gonad to 63.3% for malignant bone tumour.
- In particular five-year survival (NS) for the most common cancer types was 85.1% for leukaemia, myeloproliferative disease, and myelodysplastic disease, 71.2% for central nervous system and miscellaneous intracranial and intraspinal neoplasm, 90.8% for lymphoma and reticuloendothelial neoplasm and 90.4% for renal tumour.

Figure 10: Five-year net survival from cancer among children diagnosed in 2008-2017 by cancer type



Note: CNS tumour = Central nervous system and miscellaneous intracranial and intraspinal neoplasm, Germ cell tumour = Germ cell tumour, trophoblastic tumour, and neoplasm of gonad, Leukaemia = Leukaemia, myeloproliferative disease, and myelodysplastic disease, Lymphoma = Lymphoma and reticuloendothelial neoplasm, Melanoma = Other malignant epithelial neoplasm and malignant melanoma, Soft tissue sarcoma = Soft tissue and other extraosseous sarcoma.

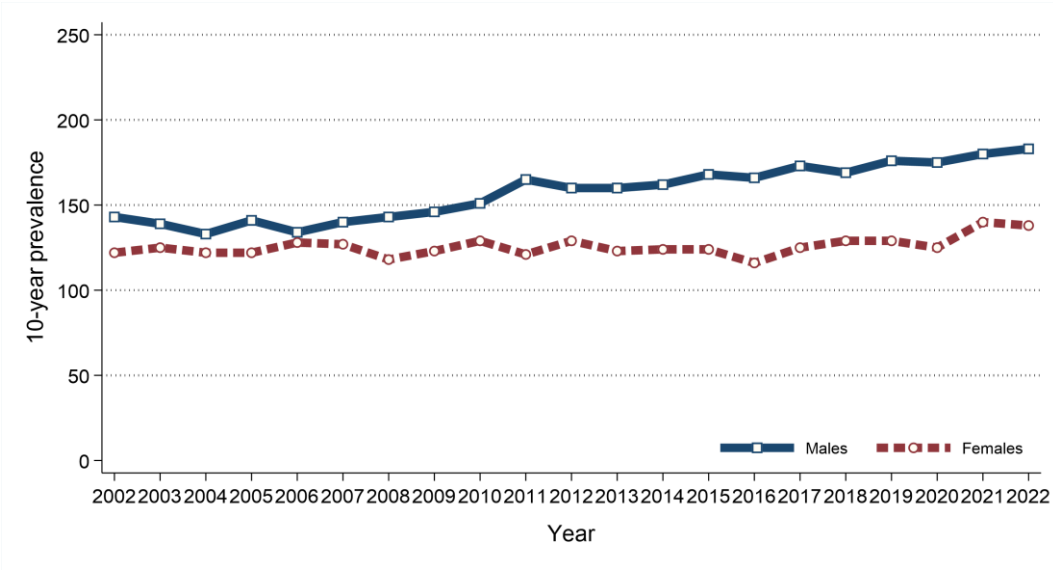
PREVALENCE

- At the end of 2022, there were 369 children (Males: 207; Females: 162) living with cancer who had been diagnosed with the disease during 2007-2022.
- Of these 11.1% had been diagnosed in the previous year (one-year prevalence) and 87.0% in the previous 10 years (ten-year prevalence).
- At the end of 2022 the most prevalent cancer types were leukaemia, myeloproliferative disease, and myelodysplastic disease (147) and central nervous system and miscellaneous intracranial and intraspinal neoplasms (65).

PREVALENCE TRENDS

- 10-year prevalence of childhood cancer among males increased between 2017 and 2022 by 5.8% from 173 survivors to 183 survivors.
- 10-year prevalence of childhood cancer among females increased between 2017 and 2022 by 10.4% from 125 survivors to 138 survivors.

Figure 11: Trends in 10-year prevalence of cancer among children in 2002-2022

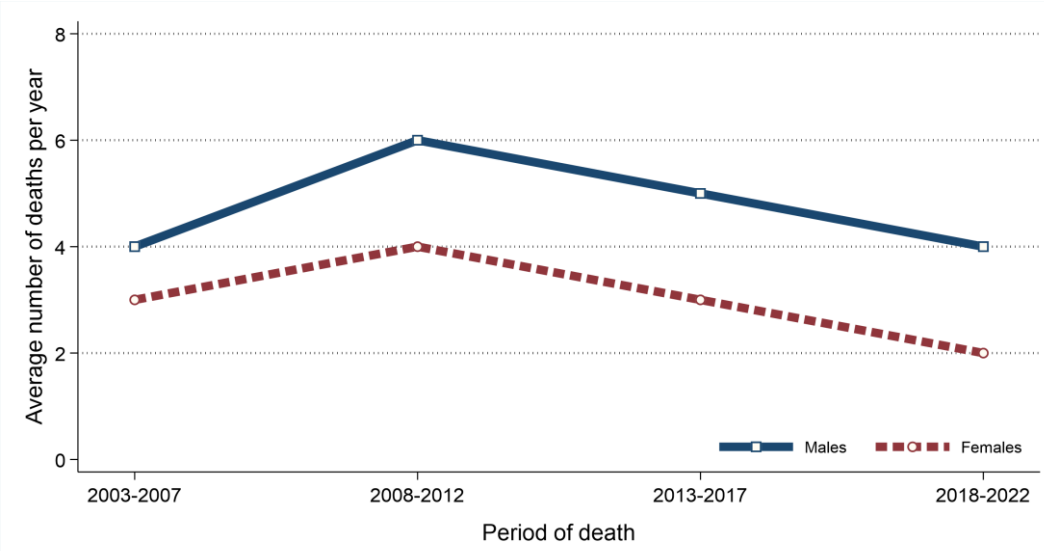


	10-year prevalence	
Year	Males	Females
2013	160	123
2014	162	124
2015	168	124
2016	166	116
2017	173	125
2018	169	129
2019	176	129
2020	175	125
2021	180	140
2022	183	138

MORTALITY

- There were 70 deaths from cancer among children (excluding non-melanoma skin cancer) during 2013-2022 in Northern Ireland. On average this was 7 deaths per year.
- During this period 34.3% of childhood cancer deaths were among girls (Male deaths: 46, Female deaths: 24). On average there were 5 male and 2 female deaths from cancer among children per year.
- The number of deaths from childhood cancer among males decreased between 2013-2017 and 2018-2022 by 29.6% from 27 deaths (5 deaths per year) to 19 deaths (4 deaths per year).
- The number of deaths from childhood cancer among females decreased between 2013-2017 and 2018-2022 by 40.0% from 15 deaths (3 deaths per year) to 9 deaths (2 deaths per year).

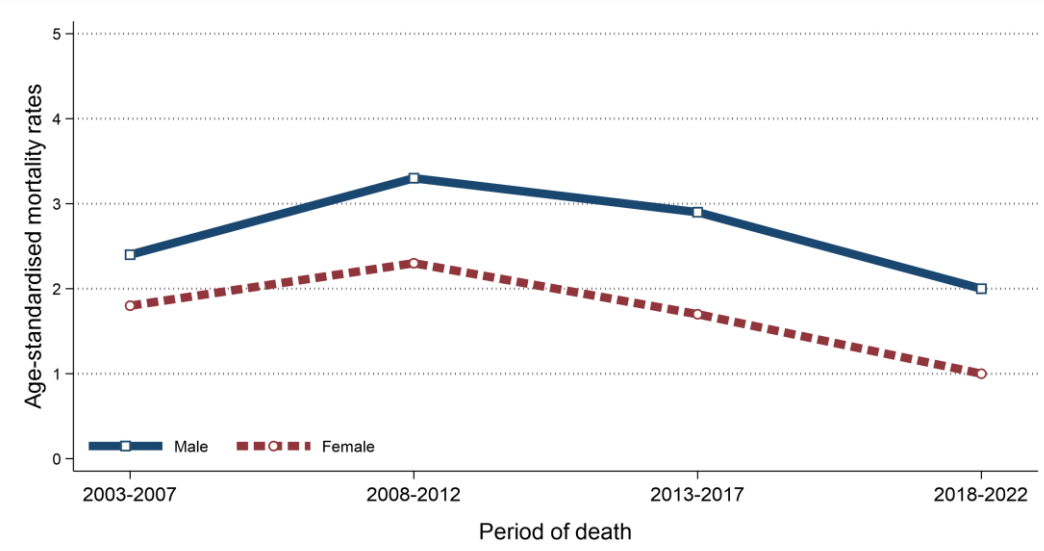
Figure 12: Trends in average number of deaths per year from cancer among children from 2003 to 2022



Period of death	Average number of deaths per year	
	Male	Female
2003-2007	4	3
2008-2012	6	4
2013-2017	5	3
2018-2022	4	2

- Male age-standardised childhood cancer mortality rates decreased between 2013-2017 and 2018-2022 by 31.0% from 2.9 to 2.0 deaths per 100,000 males. This change was not statistically significant.
- Female age-standardised childhood cancer mortality rates decreased between 2013-2017 and 2018-2022 by 41.2% from 1.7 to 1.0 deaths per 100,000 females. This change was not statistically significant.

Figure 13: Trends in mortality rates of cancer among children from 2003 to 2022



Age-standardised mortality rates illustrate the change in the number of deaths within a population of a fixed size and age structure (2013 European Standard).

They thus represent changes other than those caused by population growth and/or ageing.

Trends can also be influenced by changes in how cancer is classified and coded.

BACKGROUND NOTES

Cancer classification: Classification of tumour sites is carried out using ICD10 codes. For a listing and explanation of ICD10 codes see: World Health Organisation at http://apps.who.int/classifications/icd10/browse/2010/en#/II

Population data: Population data for Northern Ireland, and smaller geographic areas, are extracted from the NI mid-year population estimates available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Geographic areas: Geographic areas are assigned based on a patient's postcode of usual residence at diagnosis using the Jul 2024 Central Postcode Directory (CPD) produced by the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Deprivation quintiles: Super output areas (SOA) are assigned to each patient based on their postcode of usual residence at diagnosis. Using the SOA each patient is assigned a socio-economic deprivation quintile based on the 2017 Multiple Deprivation Measure. The 2017 Multiple Deprivation Measure is available from the NI Statistics and Research Agency (available at www.nisra.gov.uk).

Crude incidence/mortality rate: The number of cases/deaths per 100,000 person years in the population. Person years are the sum of the population over the number of years included.

Age-standardised incidence/mortality rates per 100,000 person years are estimates of the incidence/mortality rate if that population had a standard age structure. Throughout this report the 2013 European Standard Population has been used. Standardising to a common Standard Population allows comparisons of incidence/mortality rates to be made between different time periods and geographic areas while removing the effects of population change and ageing.

Standardised Incidence/Mortality Ratio (SIR/SMR) is the ratio of the number of cases/deaths observed in a population to the expected number of cases/deaths, based upon the age-specific rates in a reference population. This statistic is often used to compare incidence/mortality rates for geographic areas (e.g. Trusts) to the national incidence/mortality rates (i.e. Northern Ireland). An SIR/SMR of 100 indicates there is no difference between the geographic area and the national average.

Confidence intervals measure the precision of a statistic (e.g. cancer among children incidence rate). Typically, when numbers are low, precision is poorer and confidence intervals will be wider. As a general rule, when comparing statistics (e.g. cancer among children incidence rate in year 2012 vs year 2013), if the confidence interval around one statistic overlaps with the interval around another, it is unlikely that there is any real difference between the two. If there is no overlap, the difference is considered to be statistically significant.

Lifetime risk is estimated as the cumulative risk of getting cancer up to age 75/85, calculated directly from the age-specific incidence rates. The odds of developing the disease before age 75/85 is the inverse of the cumulative risk.

Prevalence is the number of cancer patients who are alive in the population on a specific date (31st December 2022 in this report). Since data from the NI Cancer Registry are only available since 1993, prevalence only refers to a fixed term (10 and 25 years in this report). There may be members of the population living with a diagnosis of cancer for more than 25 years.

Patient survival is evaluated using two measures. Observed survival examines the time between diagnosis and death from any cause. It thus represents what cancer patients experience, however, due to the inclusion of non-cancer deaths (e.g. heart disease), it may not reflect how changes in cancer care impact survival from cancer. Thus age-standardised net survival is also examined. This measure provides an estimate of patient survival which has been adjusted to take account of deaths unrelated to cancer. It also assumes a standard age distribution thereby removing the impact of changes in the age distribution of cancer patients on changes in survival over time. While this measure is hypothetical, as it assumes patients can only die from cancer related factors, it is a better indicator of the impact of changes in cancer care on patient survival.